

The Examiner has objected to the Abstract of the Disclosure and to the Title. The Abstract and Title have been amended to incorporate the Examiner's kind suggestions, and accordingly, withdrawal of these objections is respectfully requested.

Claims 1-8 were rejected under 35 U.S.C. § 112, second paragraph, as indefinite. Applicant has amended claim 1 to more clearly define that the conductive material is an outer coating for the oxide superconductor. Claim 3 and added claim 22 define the metals and alloys, respectively, that are useful conductive materials in the present invention. Accordingly, the Rule 112 objections having been met, they should be withdrawn.

Claims 1-3 were rejected under 35 U.S.C. § 102(b) as anticipated by Hayashi. Claim 4 was rejected under 35 U.S.C. § 103 as unpatentable over Hayashi in view of Den. Claim 5 was rejected under 35 U.S.C. § 103 as unpatentable over Hayashi in view of Toreki. Claim 6 was rejected under 35 U.S.C. § 103 as unpatentable over Hayashi in view of Akimitsu. Claim 7 was rejected under 35 U.S.C. § 103 as unpatentable over Hayashi in view of Den. Claim 8 was rejected under 35 U.S.C. § 103 as unpatentable over Hayashi in view of Toreki. Applicants respectfully traverse these rejections.

Prior to addressing the rejections, Applicants wish to point out some of the key features of the present invention. The materials comprising the oxide superconductor

of the present invention include Ln-Sr-Cu-M-O; Ln-Ca-Sr-Cu-M-O; Ln-Ca-Sr-Ba-Cu-O-C; Ln-Ca-Sr-Ba-Cu-B-O; and Ln-(Ca, Sr)-Ba-Cu-Ti-O. One of the key structural features of the superconducting wire of the present invention is the presence of solidified metallic materials dispersed within the oxide superconductor. The solidified metallic materials fill any gaps or voids between oxide superconductor grains or within the oxide superconductor matrix thereby improving the critical current that can be maintained by the wire, as indicated in the embodiments and examples in the specification. The metallic material may be heated with the oxide superconductor to a temperature at which the metallic material melts. The liquid metal flows into, solidifies and fills gaps and voids in the oxide superconductor material, thereby eliminating undesired voids in the superconductor matrix. Use of the added elements M, C, B and Ti, in the oxide superconductor, provides the further advantages of improved density of critical current and improved mechanical strength.

Claims 1-3 were rejected under 35 U.S.C. § 102(b) as anticipated by Hayashi. Claim 1 has been amended to include the materials of former claims 4-8; materials that are not anticipated by Hayashi. Accordingly, Applicants believe that this rejection is overcome and withdrawal, thereof is respectfully requested.

Claims 4-8 have been cancelled thus rendering the remaining rejections moot. However, because the subject

matter of these cancelled claims has been incorporated into the pending claims, the merits of these rejections will be addressed.

Each of claims 4-8 were rejected over Hayashi and a reference teaching a specific superconducting oxide, as claimed. Applicant asserts that Hayashi, in combination with the disclosure of superconducting oxides, fails to render the present invention obvious.

Hayashi describes a process of mixing ceramic and metal powders together and working the powders (contained within a pipe) to form a wire. In the process, the metal powders are heated, but they are not heated to a temperature high enough to melt the metal powder. Accordingly, the wire described by Hayashi contains an admixture of solid particles, in random contact. In contrast, the process of the present invention forms a wire by heating an oxide superconductor contained in a pipe, composed of the metallic material. When the pipe/oxide is heated to the melting point of the metal material, the melted metal flows into the oxide superconductor, filling voids or gaps between the oxide grains and solidifies, thereby providing direct electrical contact between the oxide grains. If the pipe/oxide is heated to a temperature high enough to melt the oxide, the metallic material again melts and flows between and the solidified oxide matrix to fill any voids or gaps present.

Accordingly, the superconductor wire that is formed by the present invention and Hayashi is of significantly

different structure. Hayashi forms a wire having little direct physical contact between the ceramic oxide particles, whereas the present invention forms a wire with substantial direct contact between the oxide superconductor materials. In Hayashi, the wire is a ceramic powder dispersed in a continuous metal matrix. The superconductive particles are said not to be in contact with each other, but to be in proximity to each other with the current flowing through the metal forming the matrix to effectuate superconductivity. Contrary thereto in the present claimed invention, a metallic material is dispersed in a substantially continuous oxide superconductor matrix. The vacancies in the superconductor matrix are filled with solidified metal to prevent reductions in critical temperature and critical current.

Hayashi also fails to teach or disclose the use of a solidified material to fill voids in an oxide matrix and none of the secondary references cited teach such use of solidified metallic materials. There is no motivation provided to modify the teaching of Hayashi to melt the metal powder matrix. This would probably have a deleterious effect on the metal matrix containing the oxide. Hayashi also describes the process of working the pipe and oxide and metal powders at a temperature that is below the melting point of the metal. None of the secondary references provide any further suggestion to use melted metallic materials.

Thus, it can be seen that Hayashi fails to render the present invention obvious. Further, the disclosures of

the secondary references fail to cure the deficiencies of Hayashi. Accordingly, the obviousness rejections based on Hayashi are deemed overcome and withdrawal thereof is respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and early passage to issue of the present application.

Applicant's undersigned attorney may be reached by telephone in our New York office at (212) 758-2400. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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